

MAJOR BRUSHLAND AREAS OF THE COAST RANGES AND SIERRA-CASCADE
FOOTHILLS IN CALIFORNIA

By A. E. Wieslander and Clark H. Gleason

There are extensive areas in California in which the presence of woody vegetation poses problems of land management. The woody vegetation ranges in size from trees to low bushes that grow in stands dense enough to shade out herbaceous ground cover or prevent ready access to the land. Such areas are commonly called "brushland." The problems of managing brushland affect, among others, graziers who want to increase the value of forage for livestock; wildlife managers who want to improve the habitat for wild game; fire control agencies who seek more effective controls for wildfire; and water users who want to maintain the type of watershed plant cover that is best for regulating streamflow and controlling soil erosion. Solution of these problems for the best interests of the greatest number of people is an important challenge in this State.

Because of the widespread interest in these brushland areas, the California Forest and Range Experiment Station is frequently asked about their location and extent, and also the kinds of woody vegetation which cover them. Accordingly, a map showing the principal brushland areas has been prepared from Forest Survey data.^{1/} It shows the extent of brushland cover types below the belt of commercial timber in the Coast Ranges and Sierra Nevada-Cascade foothills. Excluded are the shrub types on areas dominated by Great Basin sagebrush east of the Sierra-Cascade Mountains and on the desert lands in the southeastern part of the State. This paper tells how the map was prepared and how the brushland acreages were determined; it also describes the cover types shown on the map.

^{1/} Wieslander, A. E., and Herbert A. Jensen. Forest areas, timber volumes, and vegetation types in California. California Forest and Range Experiment Station, Forest Survey Release No. 4, 66 pp., March 1, 1946.

Procedure

The brushland areas map was generalized from the map "Vegetation Types of California, January 1, 1945," which was prepared by the Forest Survey Division of this Station and published on a scale of 1:1,000,000.^{2/} Steps in preparing the 1945 map and the current generalization were as follows:

1. All cover types were delineated on air photos to a minimum area of 500 acres.
2. The types were transferred to maps of 1:125,000 scale (approximately 1 inch = 2 miles) to a minimum area of 500 acres; acreages were measured by dot-counting on these maps.
3. The types were then generalized on the state map of 1:1,000,000 scale (approximately 1 inch = 16 miles) to a minimum area of 2,500 acres. This is the vegetation type map of 1945.
4. On the vegetation type map of 1945, areas were outlined in which the following 5 cover types are dominant: Woodland, woodland-grass, chaparral, minor conifers, and coastal sagebrush.
5. To make the map of brushland areas the two woodland types and the three chaparral and associated types were shown in two groups, also on a scale of 1:1,000,000.^{3/} Figure 1 is a photographic reduction of this map.

Brushland Acreage

Excluding areas suitable for growing timber, the Coast Ranges and Sierra-Cascade foothills contain a total of 20 million acres on which woody vegetation introduces more or less of a problem in land management.^{4/} Of this total, 9 million acres are woodland types, and 11 million acres are chaparral and associated types. The brushland acreage is found in five cover types, as follows:

^{2/} Blue-line prints of the vegetation type map can be obtained from the U. S. Forest Service, 630 Sansome Street, San Francisco 11, at \$1.00 each. Make check or money order payable to Treasurer of the United States.

^{3/} Blue-line prints of the full-scale brushland areas map can also be obtained from the Forest Service, at \$1.00 each.

^{4/} Wieslander and Jensen, table 1, op. cit. Acreage computed from table 1 by subtracting the area of each type on sites classified as suitable for growing timber.

| <u>Type</u> | <u>Million acres</u> | |
|-----------------------|--------------------------|-------|
| Woodland | 1.5 | |
| Woodland-grass | <u>7.5</u> | |
| Total woodland types | | 9.0 |
| Chaparral | 8.5 | |
| Minor conifers | .5 | |
| Coastal sagebrush | <u>2.0</u> | |
| Total chaparral types | | 11.0 |
| | | <hr/> |
| All brushland types | | 20.0 |

Owing to generalizations made after the acreages were determined, some brushland areas will be found outside the areas shown on the accompanying map (fig. 1). Also owing to the generalizations, the areas mapped embrace some cover types, such as grassland, in which there is no woody vegetation. The generalizations do not affect the overall accuracy of the acreage determinations.

Woodland Types

The woodland and woodland-grass types are characterized by hardwood trees, often in association with Digger pine. Grass is the ground cover in extensive areas. The woodland, which covers about 1.5 million acres, includes relatively dense stands of trees alone (fig. 2), or mixtures of trees and shrubs commonly called woodland-chaparral (fig. 3). The hardwood trees are of several species, mainly interior live oak, coast live oak, blue oak, Oregon white oak, canyon oak, California laurel, and madrone. Most of the canyon oak stands are restricted to steep, rocky slopes. The woodland-grass, which covers about 7.5 million acres, includes relatively open stands of trees in association with grass alone (fig. 4) or mixtures of shrubs and grass (fig. 5). Included in the woodland-grass type are pure and mixed stands of such hardwoods as blue, Oregon white, valley, interior live, and coast live oaks. Shrubs such as wedgeleaf ceanothus, common and whiteleaf manzanita, California coffeeberry, and poison oak are common in much of the type. The grasses and associated herbaceous plants are mainly annuals.

In the woodland-grass type are substantial areas without shrubby vegetation. In such areas the woody vegetation consists of scattered, open-crowned blue or valley oak trees that shade out relatively little of the herbaceous ground cover (fig. 4). Just how much of the type as mapped is characterized by open stands of this kind is not accurately known. Such a determination was made, however, for a fairly large body of the woodland-grass type in connection with

a land use study covering six counties east of the Sacramento River.^{5/} Of 660,000 acres mapped in the six-county area, nearly 30 percent was found to have practically no shrubby growth that would interfere with grazing or other land uses.

Chaparral and Associated Types

Chaparral, minor conifers, and coastal sagebrush make up the second broad class of brushland. In these types the plants are characteristically crowded together, and little or no grass grows under their closed canopy. The chaparral (fig. 6) covers about 8.5 million acres. It consists of relatively dense stands of shrubs typically 6 to 8 feet tall, of such species as chamise, manzanita, ceanothus, and scrub oaks. The minor conifers (fig. 7), which cover 0.5 million acres usually intermingled with chaparral, are trees such as knobcone pine, Coulter pine, and scrub cypresses. The coastal sagebrush (fig. 8), which occupies about 2.0 million acres, consists of bushes 3 to 5 feet tall, characterized by such species as black sage, white sage, California sagebrush, California buckwheat, and coyote brush; most of this type also occurs adjacent to or intermingled with the chaparral.

The chaparral and associated minor conifer types, in contrast with the woodland types, almost everywhere are dense enough to restrict land uses such as grazing and hunting. On the other hand, coastal sagebrush is less troublesome in this respect because of its smaller stature and more open growth habit (fig. 8). It is chiefly in the chaparral, minor conifer, coastal sagebrush, and dense woodland types that efforts are being made to substitute for the woody vegetation some other type of cover that will facilitate land use and management, yet give an equal or better degree of watershed protection.

The brushland areas map, then, shows the gross acreage and the character of cover types which create problems in the use and management of wild lands below the commercial timber belt in California, excluding the sagebrush areas east of the Sierra-Cascade Mountains and the desert lands in the southeastern part of the State. The proportion of these brushland areas which can be improved with respect to their plant cover remains to be determined.

^{5/} Weeks, David; A. E. Wieslander, H. R. Josephson, and C. L. Hill. Land utilization in the northern Sierra Nevada. University of California Agric. Expt. Sta. Special publication of the Giannini Foundation of Agricultural Economics, Berkeley, 127 pp., illus., 1943.

MAJOR BRUSHLAND AREAS OF THE COAST RANGES AND SIERRA-CASCADE FOOTHILLS IN CALIFORNIA

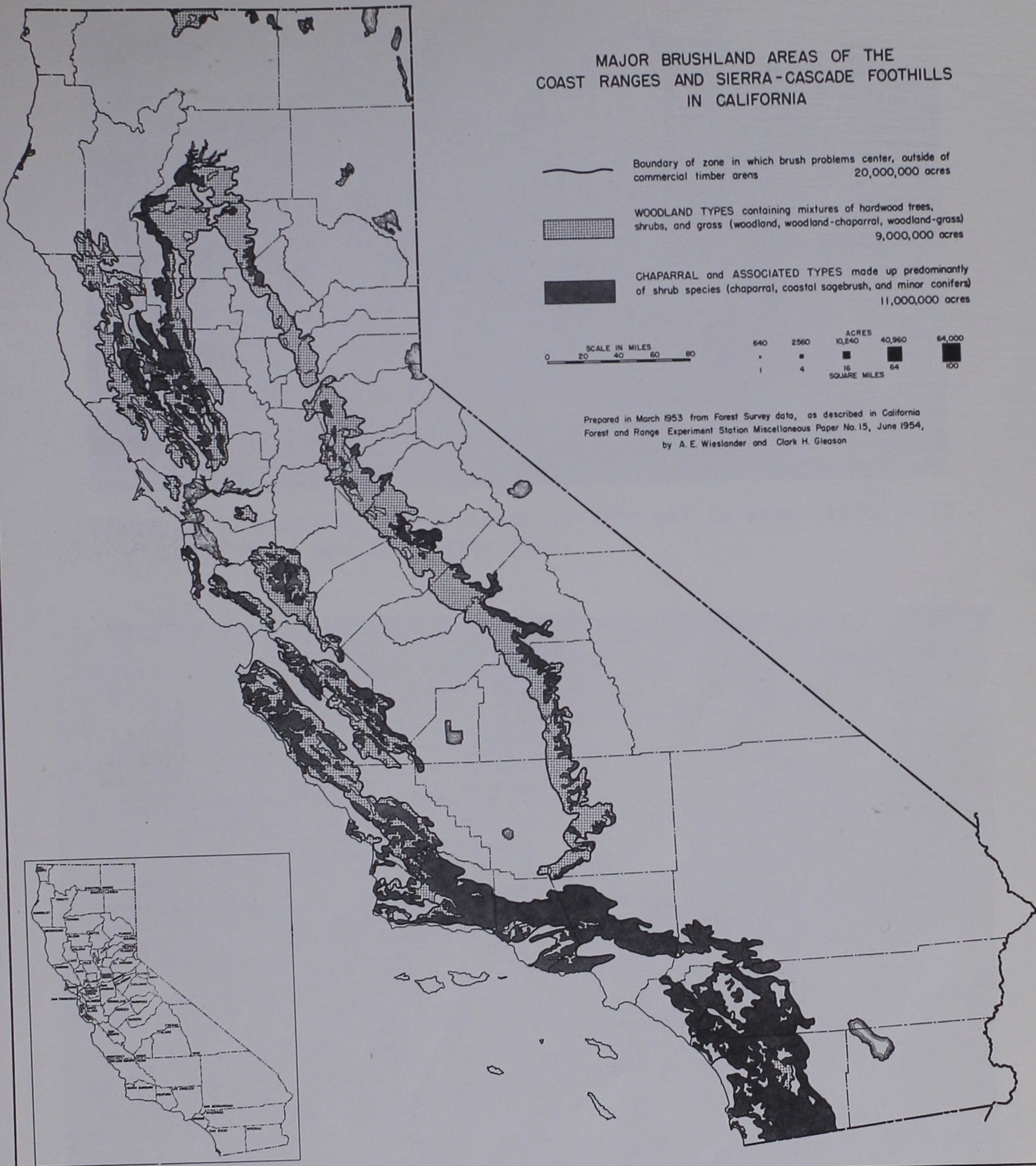


Figure 1. - Major Brushland Areas of the Coast Ranges and Sierra-Cascade Foothills in California.



Figure 2. - Woodland type of interior live oak in association with blue oak and Digger pine.



Figure 3. - Woodland type of blue oak and Digger pine in association with whiteleaf manzanita, wedgeleaf ceanothus and poison oak.



Figure 4. - Woodland-grass type of blue oak in association with annual grasses.



Figure 5. - Woodland-grass type of blue oak and Digger pine in association with whiteleaf manzanita, wedgeleaf ceanothus, and annual grasses.



Figure 6. - Chaparral type of chamise and manzanita.



Figure 7. - Minor conifer type of Sargent cypress.



Figure 8. - Coastal sagebrush type of California sagebrush, white sage and wild buckwheat.

Agriculture--Berkeley